SEQUENCE LISTING

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<120>   ESSENTIAL DOWNSTREAM COMPONENT OF THE WINGLESS SIGNALING PATHWAY AND THERAPEUTIC AND DIAGNOSTIC APPLICATIONS BASED THEREON

<130>   Q60361

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<160>   22

<170>   PatentIn version 3.1

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Ser Pro Thr Gln Gln Gln Pro Gln Pro Asn Ser Asp Ala Ser Ser Thr
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Ser Ala Ser Gly Ser Asn Pro Gly Ala Ala Ile Gly Asn Gly Asp Ser
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Ala Ala Ser Arg Ser Ser Pro Lys Thr Leu Asn Ser Glu Pro Phe Ser
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Gln Ala Ala Gly Gly Gly Cys Glu Thr Gly Ser Thr Ser Ser Leu Thr
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Val Lys Glu Glu Pro Thr Asp Val Leu Gly Ser Leu Val Asn Met Lys
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aaa gaa gaa aga gaa aat cat tcg cca acg atg tcc cct gtt ggt ttt     1626
Lys Glu Glu Arg Glu Asn His Ser Pro Thr Met Ser Pro Val Gly Phe
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Val Lys Ile Glu Arg Ile Ser Asn Asp Ser Thr Thr Glu Lys Lys Gly
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Ser Ser Leu Thr Met Asn Asn Asp Glu Met Ser Met Glu Gly Cys Asn
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cag ttg aat ccc gat ttt atc aat gaa tct tta aat aat cct gca att   2537
Gln Leu Asn Pro Asp Phe Ile Asn Glu Ser Leu Asn Asn Pro Ala Ile
255   260   265   270

tcg agc ata tta gta agc gga gta gga cca ata ccc gga atc gga gtt   2585
Ser Ser Ile Leu Val Ser Gly Val Gly Pro Ile Pro Gly Ile Gly Val
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gga gcg ggg acg gga aat tta ttg act gcc aac gcc aat gga atc tcc   2633
Gly Ala Gly Thr Gly Asn Leu Leu Thr Ala Asn Ala Asn Gly Ile Ser
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Ser Gly Ser Ser Asn Cys Leu Asp Tyr Met Gln Gln Gln Asn His Ile
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Phe Val Phe Ser Thr Gln Leu Ala Asn Lys Gly Ala Glu Ser Val Leu
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agc ggt caa ttt caa act att att gcg tat cac tgc act cag cct gct   2777
Ser Gly Gln Phe Gln Thr Ile Ile Ala Tyr His Cys Thr Gln Pro Ala
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aca aaa agc ttc ctg gaa gac ttt ttt atg aaa aac cct tta aag att   2825
Thr Lys Ser Phe Leu Glu Asp Phe Phe Met Lys Asn Pro Leu Lys Ile
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Asn Lys Leu Gln Arg His Asn Ser Val Gly Met Pro Trp Ile Gly Met
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ggg cag gtt gga cta act cct cct aat cct gta gcc aaa ata aca caa   2921
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caa cat gaa aac agc aaa cgt agt act gta agc gcg cct agc aac tct        3017
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415                 420                 425                 430


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Phe Val Asp Gln Ser Asp Pro Met Gly Asn Glu Thr Glu Leu Met Cys
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tgg gaa ggc gga tcc tca aac acc agt agg tct gga caa aac tca cga        3113
Trp Glu Gly Gly Ser Ser Asn Thr Ser Arg Ser Gly Gln Asn Ser Arg
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aat cat gta gac agt atc agt aca tcc agc gag tca cag gca ata aag        3161
Asn His Val Asp Ser Ile Ser Thr Ser Ser Glu Ser Gln Ala Ile Lys
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ata ctg gaa gca gct ggc gtt gat ttg gga cag gtc aca aaa gga agc        3209
Ile Leu Glu Ala Ala Gly Val Asp Leu Gly Gln Val Thr Lys Gly Ser
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gat cct ggc ctg aca act gaa aac aac att gta tca ctg caa gga gtt        3257
Asp Pro Gly Leu Thr Thr Glu Asn Asn Ile Val Ser Leu Gln Gly Val
495                 500                 505                 510


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Lys Val Pro Asp Glu Asn Leu Thr Pro Gln Gln Arg Gln His Arg Glu
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gaa cag ttg gca aaa ata aaa aaa atg aat caa ttt ctt ttt cct gaa        3353
Glu Gln Leu Ala Lys Ile Lys Lys Met Asn Gln Phe Leu Phe Pro Glu
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Ile Asn Pro Thr Met Arg Gln Leu His Met Pro Gly Asn Ala Lys Ser
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Gly Thr Thr Ala Ala Gly Val Asn Val Asn Met His Cys Ser Ser Ser
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Arg Ser Ala Ser Val Pro Ile Ala Thr Gln Ser Pro Asn Pro Ser Ser
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Gly Leu Pro Thr Asn Ser Pro Ser Met Asp Gly Thr Gly Ser Leu Ser
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Gly Ser Val Pro Gln Ala Asn Thr Ser Thr Val Gln Ala Gly Thr Thr
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aca gtg ctc tca gca aac aag aac tgt ttt cag gca gac acc cca tcg          4265
Thr Val Leu Ser Ala Asn Lys Asn Cys Phe Gln Ala Asp Thr Pro Ser
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Arg Pro Ser Pro Gln Gly Gln Arg Ser Pro Val Asn Ser Leu Ile Glu
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gca aat aaa gat gta cga ttt gct gca tcc agt cct ggt ttt aac ccg       4795
Ala Asn Lys Asp Val Arg Phe Ala Ala Ser Ser Pro Gly Phe Asn Pro
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His Pro His Met Gln Ser Asn Ser Asn Ser Ala Leu Asn Ala Tyr Lys
930             935             940             945

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Met Gly Ser Thr Asn Ile Gln Met Glu
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Gly Gly Ser Val Gln Phe Ser Arg Arg Ser Asp Asn Ile Pro Leu Asn
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Pro Asn Ser Gly Asn Arg Pro Pro Pro Asn Lys Met Thr Gln Asn Phe
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Asp Pro Ile Ser Ser Leu Ala Gln  Met Ser Gln Gln Leu  Thr Ser Cys
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Val Ser  Ser Met Gly Ser Pro  Ala Gly Thr Gly Gly  Met Thr Met
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Ile Ser Gly Leu Asp Gly Ser  Gly Ile Asp Thr Ile  Asn Gln Asn
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Asn Cys His Ser Met Asn Val  Val Met Asn Ser Met  Gly Pro Arg
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Met Leu Asn Pro Lys Met Cys  Val Ala Gly Gly Pro  Asn Gly Pro
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cct ggc ttt aat cct aat tcc  ccc aat ggt gga tta  aga gag aat      5358
Pro Gly Phe Asn Pro Asn Ser  Pro Asn Gly Gly Leu  Arg Glu Asn
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tcc ata ggg tct ggc tgt ggc  tca gca aac tct tca  aac ttt caa      5403
Ser Ile Gly Ser Gly Cys Gly  Ser Ala Asn Ser Ser  Asn Phe Gln
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Gly Val Val Pro Pro Gly Ala  Arg Met Met Gly Arg  Met Pro Val
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Asn Phe Gly Ser Asn Phe Asn  Pro Asn Ile Gln Val  Lys Ala Ser
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acc cca aac acc ata caa tac  atg cca gta agg gca  cag aac gcc      5538
Thr Pro Asn Thr Ile Gln Tyr  Met Pro Val Arg Ala  Gln Asn Ala
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aac aac aat aac aac aat gga  gct aat aat gtg cga  atg cca cct      5583
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Ser Leu Glu Phe Leu Gln Arg  Tyr Ala Asn Pro Gln  Met Gly Ala
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Val Gly Asn Gly Ser Pro Ile  Cys Pro Pro Ser Ala  Ser Asp Gly
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Thr Pro Gly Met Pro Gly Leu  Met Ala Gly Pro Gly  Ala Gly Gly
    1205                         1210                        1215

atg cta atg aat tct tcc gga  gag caa cac cag aac  aag atc aca      5763
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aat caa atg tct att gtt gac  gaa gag ggt gga tta  ccc ggc cat          5853
Asn Gln Met Ser Ile Val Asp  Glu Glu Gly Gly Leu  Pro Gly His
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gac gga tca atg aat att ggt  caa cca tct atg ata  agg ggc atg          5898
Asp Gly Ser Met Asn Ile Gly  Gln Pro Ser Met Ile  Arg Gly Met
    1265                1270              1275

cgt cca cat gcc atg cgg cca  aat gta atg ggt gcg  cgg atg cca          5943
Arg Pro His Ala Met Arg Pro  Asn Val Met Gly Ala  Arg Met Pro
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ccc gtt aac agg caa att cag  ttt gca cag tca tcg  gat ggt att          5988
Pro Val Asn Arg Gln Ile Gln  Phe Ala Gln Ser Ser  Asp Gly Ile
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gac tgt gtc ggg gat ccg tca  tca ttt ttc act aac  gct tcc tgc          6033
Asp Cys Val Gly Asp Pro Ser  Ser Phe Phe Thr Asn  Ala Ser Cys
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aac agc gct gga cca cac atg  ttt gga tca gca caa  cag gcc aat          6078
Asn Ser Ala Gly Pro His Met  Phe Gly Ser Ala Gln  Gln Ala Asn
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cag cct aag aca caa cac ata  aag aac ata cct agt  gga atg tgt          6123
Gln Pro Lys Thr Gln His Ile  Lys Asn Ile Pro Ser  Gly Met Cys
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Gln Asn Gln Ser Gly Leu Ala  Val Ala Gln Gly Gln  Ile Gln Leu
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cat ggg caa gga cat gcg cag  ggt cag tct tta att  gga cct act          6213
His Gly Gln Gly His Ala Gln  Gly Gln Ser Leu Ile  Gly Pro Thr
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aat aat aat tta atg tca act  gcc gga agt gtc agt  gct act aac          6258
Asn Asn Asn Leu Met Ser Thr  Ala Gly Ser Val Ser  Ala Thr Asn
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ggt gtc tct ggc atc aat ttc  gta ggt ccc tct tct  acg gac ctg          6303
Gly Val Ser Gly Ile Asn Phe  Val Gly Pro Ser Ser  Thr Asp Leu
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Lys Tyr Ala Gln Gln Tyr His  Ser Phe Gln Gln Gln  Leu Tyr Ala
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acc aac acc aga agt caa caa  caa cag cat atg cac  cag cag cac          6393
Thr Asn Thr Arg Ser Gln Gln  Gln Gln His Met His  Gln Gln His
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cag agc  aac atg ata aca atg  ccg ccg aat tta tca  cca aat cca      6438
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Thr Phe  Phe Val Asn Lys
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agcagctatt ttctgttatt atttaatatg tgcgctgctc tctctgtgtt aaatgaaatt  6786

aaaatatata tataaatgta aaacgctatt gatatatatt gctctcaact gtattgtaat  6846

caatattaag agaactgtaa attcttccat ataaaggtaa tgaaaaaaaa aaaaaaaaaa  6906

aaa                                                                6909


<210>  2
<211>  28
<212>  PRT
<213>  Drosophila lgs

<400>  2

Ile Phe Val Phe Ser Thr Gln Leu Ala Asn Lys Gly Ala Glu Ser Val
1               5                   10                  15

Leu Ser Gly Gln Phe Gln Thr Ile Ile Ala Tyr His
            20                  25


<210>  3
<211>  28
<212>  PRT
<213>  Human lgs/bcl9

<400>  3

Val Tyr Val Phe Ser Thr Glu Met Ala Asn Lys Ala Ala Glu Ala Val
1               5                   10                  15

Leu Lys Gly Gln Val Glu Thr Ile Val Ser Phe His
            20                  25


<210>  4
<211>  35
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<212>   PRT
<213>   Drosophila lgs

<400>   4

Glu Asn Leu Thr Pro Gln Gln Arg Gln His Arg Glu Glu Gln Leu Ala
1               5                   10                  15


Lys Ile Lys Lys Met Asn Gln Phe Leu Phe Pro Glu Asn Glu Asn Ser
            20                  25                  30


Val Gly Ala
        35


<210>   5
<211>   35
<212>   PRT
<213>   Human lgs/bcl9

<400>   5

Asp Gly Leu Ser Gln Glu Gln Leu Glu His Arg Glu Arg Ser Leu Gln
1               5                   10                  15


Thr Leu Arg Asp Ile Gln Arg Met Leu Phe Pro Asp Glu Lys Glu Phe
            20                  25                  30


Thr Gly Ala
        35


<210>   6
<211>   15
<212>   PRT
<213>   Drosophila lgs

<400>   6

Gln Met Glu Trp Ser Lys Ile Gln His Gln Phe Phe Glu Glu Arg
1               5                   10                  15


<210>   7
<211>   15
<212>   PRT
<213>   Human lgs/bcl9

<400>   7

Gln Ile Ala Trp Leu Lys Leu Gln Gln Glu Phe Tyr Glu Glu Lys
1               5                   10                  15
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<210> 8
<211> 9
<212> PRT
<213> Drosophila lgs

<400> 8

Leu Gln Gly Pro Pro Pro Pro Tyr His
1   5

<210> 9
<211> 9
<212> PRT
<213> Human lgs/bcl9

<400> 9

Val Arg Gly Pro Pro Pro Pro Tyr Gln
1   5

<210> 10
<211> 112
<212> PRT
<213> Drosophila lgs

<400> 10

Ser Ala Ser Val Pro Ile Ala Thr Gln Ser Pro Asn Pro Ser Ser Pro
1   5   10   15

Asn Asn Leu Ser Leu Pro Ser Pro Arg Thr Thr Ala Ala Val Met Gly
            20   25   30

Leu Pro Thr Asn Ser Pro Ser Met Asp Gly Thr Gly Ser Leu Ser Gly
        35   40   45

Ser Val Pro Gln Ala Asn Thr Ser Thr Val Gln Ala Gly Thr Thr Thr
    50   55   60

Val Leu Ser Ala Asn Lys Asn Cys Phe Gln Ala Asp Thr Pro Ser Pro
65   70   75   80

Ser Asn Gln Asn Arg Ser Arg Asn Thr Gly Ser Ser Ser Val Leu Thr
                85   90   95

His Asn Leu Ser Ser Asn Pro Ser Thr Pro Leu Ser His Leu Ser Pro
                100   105   110

<210> 11
<211> 111
<212> PRT
<213> Human lgs/bcl9

<400> 11

Gly Pro Pro Pro Pro Thr Ala Ser Gln Pro Ala Ser Val Asn Ile Pro
1   5   10   15

Gly Ser Leu Pro Ser Ser Thr Pro Tyr Thr Met Pro Pro Glu Pro Thr
            20   25   30

Leu Ser Gln Asn Pro Leu Ser Ile Met Met Ser Arg Met Ser Lys Phe
            35   40   45

Ala Met Pro Ser Ser Thr Pro Leu Tyr His Asp Ala Ile Lys Thr Val
    50   55   60

Ala Ser Ser Asp Asp Asp Ser Pro Pro Ala Arg Ser Pro Asn Leu Pro
65   70   75   80

Ser Met Asn Asn Met Pro Gly Met Gly Ile Asn Thr Gln Asn Pro Arg
            85   90   95

Ile Ser Gly Pro Asn Pro Val Val Pro Met Pro Thr Leu Ser Pro
            100   105   110

<210> 12
<211> 16
<212> PRT
<213> Drosophila lgs

<400> 12

Asn Pro Lys Met Cys Val Ala Gly Gly Pro Asn Gly Pro Pro Gly Phe
1   5   10   15

<210> 13
<211> 16
<212> PRT
<213> Human lgs/bcl9

<400> 13

Asp Ala Ala Leu Cys Lys Pro Gly Gly Pro Gly Gly Pro Asp Ser Phe
1   5   10   15

<210> 14
<211> 4281
<212> DNA
<213> Human lgs/bcl9

<400> 14

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ccatccccct gtgactccaa gagtgggggc catacccta aagcactccc tggcccaggt       240

gggagcatgg ggctgaagaa tggggctgga aatggtgcca agggcaaggg gaaaagggag     300

cgaagtattt ccgccgactc ctttgatcag agagatcctg ggactccaaa cgatgactct     360

gacattaaag aatgtaattc tgctgaccac ataaagtccc aggattccca gcacacacca     420

cactcgatga ccccatcaaa tgctacagcc cccaggtctt ctacccctc ccatggccaa       480

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aaaccagaag ggccaataca ggccatgatg gcccaatccc aaagcctagg taagggacct    1260

gggccccgga cagacgtggg agctccattt ggccctcaag acatagaga tgtacccttt     1320

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caccttgacc atatgactcc cgagcagata gcgtggctga aactgcagca ggagttttat     1440

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gatggtcgaa attttcctcc tggccagggc attttcagcg gtcctggccg aggggaacgc    1860

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<210> 15
<211> 1426
<212> PRT
<213> Human lgs/bcl9

<400> 15

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Met His Ser Ser Asn Pro Lys Val Arg Ser Ser Pro Ser Gly Asn Thr
1               5               10              15


Gln Ser Ser Pro Lys Ser Lys Gln Glu Val Met Val Arg Pro Pro Thr
            20              25              30


Val Met Ser Pro Ser Gly Asn Pro Gln Leu Asp Ser Lys Phe Ser Asn
        35              40              45
```

```
Gln Gly Lys Gln Gly Gly Ser Ala Ser Gln Ser Gln Pro Ser Pro Cys
    50              55                  60

Asp Ser Lys Ser Gly Gly His Thr Pro Lys Ala Leu Pro Gly Pro Gly
65              70              75                  80

Gly Ser Met Gly Leu Lys Asn Gly Ala Gly Asn Gly Ala Lys Gly Lys
            85              90                  95

Gly Lys Arg Glu Arg Ser Ile Ser Ala Asp Ser Phe Asp Gln Arg Asp
        100             105             110

Pro Gly Thr Pro Asn Asp Asp Ser Asp Ile Lys Glu Cys Asn Ser Ala
        115             120             125

Asp His Ile Lys Ser Gln Asp Ser Gln His Thr Pro His Ser Met Thr
    130             135             140

Pro Ser Asn Ala Thr Ala Pro Arg Ser Ser Thr Pro Ser His Gly Gln
145             150             155             160

Thr Thr Ala Thr Glu Pro Thr Pro Ala Gln Lys Thr Pro Ala Lys Val
            165             170             175

Val Tyr Val Phe Ser Thr Glu Met Ala Asn Lys Ala Ala Glu Ala Val
            180             185             190

Leu Lys Gly Gln Val Glu Thr Ile Val Ser Phe His Ile Gln Asn Ile
        195             200             205

Ser Asn Asn Lys Thr Glu Arg Ser Thr Ala Pro Leu Asn Thr Gln Ile
    210             215             220

Ser Ala Leu Arg Asn Asp Pro Lys Pro Leu Pro Gln Gln Pro Pro Ala
225             230             235             240

Pro Ala Asn Gln Asp Gln Asn Ser Ser Gln Asn Thr Arg Leu Gln Pro
            245             250             255

Thr Pro Pro Ile Pro Ala Pro Ala Pro Lys Pro Ala Ala Pro Pro Arg
            260             265             270

Pro Leu Asp Arg Glu Ser Pro Gly Val Glu Asn Lys Leu Ile Pro Ser
```

```
Val Gly Ser Pro Ala Ser Ser Thr Pro Leu Pro Pro Asp Gly Thr Gly
    290                 295                 300

Pro Asn Ser Thr Pro Asn Asn Arg Ala Val Thr Pro Val Ser Gln Gly
305                 310                 315                 320

Ser Asn Ser Ser Ser Ala Asp Pro Lys Ala Pro Pro Pro Pro Pro Val
                325                 330                 335

Ser Ser Gly Glu Pro Pro Thr Leu Gly Glu Asn Pro Asp Gly Leu Ser
            340                 345                 350

Gln Glu Gln Leu Glu His Arg Glu Arg Ser Leu Gln Thr Leu Arg Asp
        355                 360                 365

Ile Gln Arg Met Leu Phe Pro Asp Glu Lys Glu Phe Thr Gly Ala Gln
    370                 375                 380

Ser Gly Gly Pro Gln Gln Asn Pro Gly Val Leu Asp Gly Pro Gln Lys
385                 390                 395                 400

Lys Pro Glu Gly Pro Ile Gln Ala Met Met Ala Gln Ser Gln Ser Leu
            405                 410                 415

Gly Lys Gly Pro Gly Pro Arg Thr Asp Val Gly Ala Pro Phe Gly Pro
            420                 425                 430

Gln Gly His Arg Asp Val Pro Phe Ser Pro Asp Glu Met Val Pro Pro
        435                 440                 445

Ser Met Asn Ser Gln Ser Gly Thr Ile Gly Pro Asp His Leu Asp His
    450                 455                 460

Met Thr Pro Glu Gln Ile Ala Trp Leu Lys Leu Gln Gln Glu Phe Tyr
465                 470                 475                 480

Glu Glu Lys Arg Arg Lys Gln Glu Gln Val Val Val Gln Gln Cys Ser
            485                 490                 495

Leu Gln Asp Met Met Val His Gln His Gly Pro Arg Gly Val Val Arg
            500                 505                 510
```

```
Gly Pro Pro Pro Pro Tyr Gln Met Thr Pro Ser Glu Gly Trp Ala Pro
    515             520             525

Gly Gly Thr Glu Pro Phe Ser Asp Gly Ile Asn Met Pro His Ser Leu
    530             535             540

Pro Pro Arg Gly Met Ala Pro His Pro Asn Met Pro Gly Ser Gln Met
545             550             555             560

Arg Leu Pro Gly Phe Ala Gly Met Ile Asn Ser Glu Met Glu Gly Pro
            565             570             575

Asn Val Pro Asn Pro Ala Ser Arg Pro Gly Leu Ser Gly Val Ser Trp
        580             585             590

Pro Asp Asp Val Pro Lys Ile Pro Asp Gly Arg Asn Phe Pro Pro Gly
    595             600             605

Gln Gly Ile Phe Ser Gly Pro Gly Arg Gly Glu Arg Phe Pro Asn Pro
    610             615             620

Gln Gly Leu Ser Glu Glu Met Phe Gln Gln Gln Leu Ala Glu Lys Gln
625             630             635             640

Leu Gly Leu Pro Pro Gly Met Ala Met Glu Gly Ile Arg Pro Ser Met
            645             650             655

Glu Met Asn Arg Met Ile Pro Gly Ser Gln Arg His Met Glu Pro Gly
            660             665             670

Asn Asn Pro Ile Phe Pro Arg Ile Pro Val Glu Gly Pro Leu Ser Pro
    675             680             685

Ser Arg Gly Asp Phe Pro Lys Gly Ile Pro Pro Gln Met Gly Pro Gly
    690             695             700

Arg Glu Leu Glu Phe Gly Met Val Pro Ser Gly Met Lys Gly Asp Val
705             710             715             720

Asn Leu Asn Val Asn Met Gly Ser Asn Ser Gln Met Ile Pro Gln Lys
            725             730             735
```

```
Met Arg Glu Ala Gly Ala Gly Pro Glu Glu Met Leu Lys Leu Arg Pro
        740             745             750

Gly Gly Ser Asp Met Leu Pro Ala Gln Gln Lys Met Val Pro Leu Pro
        755             760             765

Phe Gly Glu His Pro Gln Gln Glu Tyr Gly Met Gly Pro Arg Pro Phe
    770             775             780

Leu Pro Met Ser Gln Gly Pro Gly Ser Asn Ser Gly Leu Arg Asn Leu
785             790             795             800

Arg Glu Pro Ile Gly Pro Asp Gln Arg Thr Asn Ser Arg Leu Ser His
            805             810             815

Met Pro Pro Leu Pro Leu Asn Pro Ser Ser Asn Pro Thr Ser Leu Asn
        820             825             830

Thr Ala Pro Pro Val Gln Arg Gly Leu Gly Arg Lys Pro Leu Asp Ile
        835             840             845

Ser Val Ala Gly Ser Gln Val His Ser Pro Gly Ile Asn Pro Leu Lys
    850             855             860

Ser Pro Thr Met His Gln Val Gln Ser Pro Met Leu Gly Ser Pro Ser
865             870             875             880

Gly Asn Leu Lys Ser Pro Gln Thr Pro Ser Gln Leu Ala Gly Met Leu
            885             890             895

Ala Gly Pro Ala Ala Ala Ala Ser Ile Lys Ser Pro Pro Val Leu Gly
        900             905             910

Ser Ala Ala Ala Ser Pro Val His Leu Lys Ser Pro Ser Leu Pro Ala
    915             920             925

Pro Ser Pro Gly Trp Thr Ser Ser Pro Lys Pro Pro Leu Gln Ser Pro
    930             935             940

Gly Ile Pro Pro Asn His Lys Ala Pro Leu Thr Met Ala Ser Pro Ala
945             950             955             960
```

Met Leu Gly Asn Val Glu Ser Gly Gly Pro Pro Pro Pro Thr Ala Ser
              965   970   975

Gln Pro Ala Ser Val Asn Ile Pro Gly Ser Leu Pro Ser Ser Thr Pro
              980   985   990

Tyr Thr Met Pro Pro Glu Pro Thr Leu Ser Gln Asn Pro Leu Ser Ile
              995   1000   1005

Met Met Ser Arg Met Ser Lys Phe Ala Met Pro Ser Ser Thr Pro
    1010   1015   1020

Leu Tyr His Asp Ala Ile Lys Thr Val Ala Ser Ser Asp Asp Asp
    1025   1030   1035

Ser Pro Pro Ala Arg Ser Pro Asn Leu Pro Ser Met Asn Asn Met
    1040   1045   1050

Pro Gly Met Gly Ile Asn Thr Gln Asn Pro Arg Ile Ser Gly Pro
    1055   1060   1065

Asn Pro Val Val Pro Met Pro Thr Leu Ser Pro Met Gly Met Thr
    1070   1075   1080

Gln Pro Leu Ser His Ser Asn Gln Met Pro Ser Pro Asn Ala Val
    1085   1090   1095

Gly Pro Asn Ile Pro Pro His Gly Val Pro Met Gly Pro Gly Leu
    1100   1105   1110

Met Ser His Asn Pro Ile Met Gly His Gly Ser Gln Glu Pro Pro
    1115   1120   1125

Met Val Pro Gln Gly Arg Met Gly Phe Pro Gln Gly Phe Pro Pro
    1130   1135   1140

Val Gln Ser Pro Pro Gln Gln Val Pro Phe Pro His Asn Gly Pro
    1145   1150   1155

Ser Gly Gly Gln Gly Ser Phe Pro Gly Gly Met Gly Phe Pro Gly
    1160   1165   1170

Glu Gly Pro Leu Gly Arg Pro Ser Asn Leu Pro Gln Ser Ser Ala

Asp Ala Ala Leu Cys Lys Pro Gly Gly Pro Gly Gly Pro Asp Ser
    1190   1195   1200

Phe Thr Val Leu Gly Asn Ser Met Pro Ser Val Phe Thr Asp Pro
    1205   1210   1215

Asp Leu Gln Glu Val Ile Arg Pro Gly Ala Thr Gly Ile Pro Glu
    1220   1225   1230

Phe Asp Leu Ser Arg Ile Ile Pro Ser Glu Lys Pro Ser Gln Thr
    1235   1240   1245

Leu Gln Tyr Phe Pro Arg Gly Glu Val Pro Gly Arg Lys Gln Pro
    1250   1255   1260

Gln Gly Pro Gly Pro Gly Phe Ser His Met Gln Gly Met Met Gly
    1265   1270   1275

Glu Gln Ala Pro Arg Met Gly Leu Ala Leu Pro Gly Met Gly Gly
    1280   1285   1290

Pro Gly Pro Val Gly Thr Pro Asp Ile Pro Leu Gly Thr Ala Pro
    1295   1300   1305

Ser Met Pro Gly His Asn Pro Met Arg Pro Pro Ala Phe Leu Gln
    1310   1315   1320

Gln Gly Met Met Gly Pro His His Arg Met Met Ser Pro Ala Gln
    1325   1330   1335

Ser Thr Met Pro Gly Gln Pro Thr Leu Met Ser Asn Pro Ala Ala
    1340   1345   1350

Ala Val Gly Met Ile Pro Gly Lys Asp Arg Gly Pro Ala Gly Leu
    1355   1360   1365

Tyr Thr His Pro Gly Pro Val Gly Ser Pro Gly Met Met Met Ser
    1370   1375   1380

Met Gln Gly Met Met Gly Pro Gln Gln Asn Ile Met Ile Pro Pro
    1385   1390   1395

```
Gln Met  Arg Pro Arg Gly Met  Ala Ala Asp Val Gly  Met Gly Gly
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Phe Ser  Gln Gly Pro Gly Asn  Pro Gly Asn Met Met  Phe
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<213>  Human lgs-1

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ggggccaagg ccaaccagat ctcgcctagc aactcaagtc tgaagaaccc ccaggcaggg     360

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caggtcctcg gctcctccct cagtgtccgt tcacccactg gctcgcccag caggctcaag    2160

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gccacctcag acgacgagct gctgcccgac cggcccctgc tgcccccccc accaccaccg    2460

cagggctccg ggccaggtgg ccccgactcc ctgaatgccc cctgtggccc agtgcccagc    2520

tcctcccaga tgatgccctt ccccccctcgg ctgcagcagc cccatggtgc catggccccc    2580

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cccgagttcg acttgtcgag gatcatcccc tctgagaagc caagcagcac cctccagtac    2880

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gcgcgattca agaaatccat ggtgaaaggt ttggattcct atgaagaaaa ggaggataaa      3480

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Thr Tyr Ser Pro Glu Thr Ser Arg Arg Lys Leu Pro Gln Ala Pro Lys
            20                  25                  30


Ala Ser Phe Leu Gly Gln Gln Gly Arg Val Ile Trp Lys Pro Leu Ser
        35                  40                  45


Glu Glu Leu Arg Asp Gln Gly Ala Asp Ala Ala Gly Gly Pro Ala Ser
    50                  55                  60
```

```
Ile Met Ser Pro Ile Ala Thr Val Asn Ala Ser Gly Leu Ser Lys Glu
65              70              75                      80


Gln Leu Glu His Arg Glu Arg Ser Leu Gln Thr Leu Arg Asp Ile Glu
            85              90                      95


Arg Leu Leu Leu Arg Ser Gly Glu Thr Glu Pro Phe Leu Lys Gly Ala
            100             105             110


Pro Arg Arg Ser Gly Gly Leu Lys Lys Tyr Glu Glu Pro Leu Gln Ser
        115             120             125


Met Ile Ser Gln Thr Gln Ser Leu Gly Gly Pro Pro Leu Glu His Glu
    130             135             140


Val Pro Gly His Pro Pro Gly Gly Asp Met Gly Gln Gln Met Asn Met
145             150             155             160


Met Ile Gln Arg Leu Gly Gln Asp Ser Leu Thr Pro Glu Gln Val Ala
            165             170             175


Trp Arg Lys Leu Gln Glu Glu Tyr Tyr Glu Glu Lys Arg Arg Lys Glu
            180             185             190


Glu Gln Ile Gly Leu His Gly Ser Arg Pro Leu Gln Asp Met Met Gly
    195             200             205


Met Gly Gly Met Met Val Arg Gly Pro Pro Pro Tyr His Ser Lys
    210             215             220


Pro Gly Asp Gln Trp Pro Pro Gly Met Gly Ala Gln Leu Arg Gly Pro
225             230             235             240


Met Asp Val Gln Asp Pro Met Gln Leu Arg Gly Gly Pro Pro Phe Pro
            245             250             255


Gly Pro Arg Phe Pro Gly Asn Gln Ile Gln Arg Val Pro Gly Phe Gly
            260             265             270


Gly Met Gln Ser Met Pro Met Glu Val Pro Met Asn Ala Met Gln Arg
    275             280             285
```

Pro Val Arg Pro Gly Met Gly Trp Thr Glu Asp Leu Pro Pro Met Gly
    290   295   300

Gly Pro Ser Asn Phe Ala Gln Asn Thr Met Pro Tyr Pro Gly Gly Gln
305   310   315   320

Gly Glu Ala Glu Arg Phe Met Thr Pro Arg Val Arg Glu Glu Leu Leu
                325   330   335

Arg His Gln Leu Leu Glu Lys Arg Ser Met Gly Met Gln Arg Pro Leu
            340   345   350

Gly Met Ala Gly Ser Gly Met Gly Gln Ser Met Glu Met Glu Arg Met
            355   360   365

Met Gln Ala His Arg Gln Met Asp Pro Ala Met Phe Pro Gly Gln Met
    370   375   380

Ala Gly Gly Glu Gly Leu Ala Gly Thr Pro Met Gly Met Glu Phe Gly
385   390   395   400

Gly Gly Arg Gly Leu Leu Ser Pro Pro Met Gly Gln Ser Gly Leu Arg
                405   410   415

Glu Val Asp Pro Pro Met Gly Pro Gly Asn Leu Asn Met Asn Met Asn
            420   425   430

Val Asn Met Asn Met Asn Met Asn Leu Asn Val Gln Met Thr Pro Gln
    435   440   445

Gln Gln Met Leu Met Ser Gln Lys Met Arg Gly Pro Gly Asp Leu Met
    450   455   460

Gly Pro Gln Gly Leu Ser Pro Glu Glu Met Ala Arg Val Arg Ala Gln
465   470   475   480

Asn Ser Ser Gly Met Val Pro Leu Pro Ser Ala Asn Pro Pro Gly Pro
                485   490   495

Leu Lys Ser Pro Gln Val Leu Gly Ser Ser Leu Ser Val Arg Ser Pro
            500   505   510

Thr Gly Ser Pro Ser Arg Leu Lys Ser Pro Ser Met Ala Val Pro Ser

```
              515                    520                      525


Pro Gly Trp Val Ala Ser Pro Lys Thr Ala Met Pro Ser Pro Gly Val
    530                 535                 540


Ser Gln Asn Lys Gln Pro Pro Leu Asn Met Asn Ser Ser Thr Thr Leu
545                 550                 555                     560


Ser Asn Met Glu Gln Asp Pro Thr Pro Ser Gln Asn Pro Leu Ser Leu
                565                 570                     575


Met Met Thr Gln Met Ser Lys Tyr Ala Met Pro Ser Ser Thr Pro Leu
                580                 585                     590


Tyr His Asn Ala Ile Lys Thr Ile Ala Thr Ser Asp Asp Glu Leu Leu
        595                 600                 605


Pro Asp Arg Pro Leu Leu Pro Pro Pro Pro Pro Gln Gly Ser Gly
    610                 615                 620


Pro Gly Gly Pro Asp Ser Leu Asn Ala Pro Cys Gly Pro Val Pro Ser
625                 630                 635                     640


Ser Ser Gln Met Met Pro Phe Pro Pro Arg Leu Gln Gln Pro His Gly
                645                 650                     655


Ala Met Ala Pro Thr Gly Gly Gly Gly Gly Pro Gly Leu Gln Gln
            660                 665                 670


His Tyr Pro Ser Gly Met Ala Leu Pro Pro Glu Asp Leu Pro Asn Gln
        675                 680                 685


Pro Pro Gly Pro Met Pro Pro Gln Gln His Leu Met Gly Lys Ala Met
    690                 695                 700


Ala Gly Arg Met Gly Asp Ala Tyr Pro Pro Gly Val Leu Pro Gly Val
705                 710                 715                     720


Ala Ser Val Leu Asn Asp Pro Glu Leu Ser Glu Val Ile Arg Pro Thr
                725                 730                     735


Pro Thr Gly Ile Pro Glu Phe Asp Leu Ser Arg Ile Ile Pro Ser Glu
            740                 745                 750
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```
Lys Pro Ser Ser Thr Leu Gln Tyr Phe Pro Lys Ser Glu Asn Gln Pro
      755             760             765

Pro Lys Ala Gln Pro Pro Asn Leu His Leu Met Asn Leu Gln Asn Met
    770             775             780

Met Ala Glu Gln Thr Pro Ser Arg Pro Pro Asn Leu Pro Gly Gln Gln
785             790             795             800

Gly Asp Arg Pro Leu Val Val Val Ile Pro Gly Thr Arg Ala Met Ala
            805             810             815

Pro Ala Gln Arg Cys Pro Leu Cys Arg Gln Thr Phe Phe Cys Gly Arg
            820             825             830

Gly His Val Tyr Ser Arg Lys His Gln Arg Gln Leu Lys Glu Ala Leu
        835             840             845

Glu Arg Leu Leu Pro Gln Val Glu Ala Ala Arg Lys Ala Ile Arg Ala
    850             855             860

Ala Gln Val Glu Arg Tyr Val Pro Glu His Glu Arg Cys Cys Trp Cys
865             870             875             880

Leu Cys Cys Gly Cys Glu Val Arg Glu His Leu Ser His Gly Asn Leu
            885             890             895

Thr Val Leu Tyr Gly Gly Leu Leu Glu His Leu Ala Ser Pro Glu His
        900             905             910

Lys Lys Ala Thr Asn Lys Phe Trp Trp Glu Asn Lys Ala Glu Val Gln
    915             920             925

Met Lys Glu Lys Phe Leu Val Thr Pro Gln Asp Tyr Ala Arg Phe Lys
    930             935             940

Lys Ser Met Val Lys Gly Leu Asp Ser Tyr Glu Glu Lys Glu Asp Lys
945             950             955             960

Val Ile Lys Glu Met Ala Ala Gln Ile Arg Glu Val Glu Gln Ser Arg
            965             970             975
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```
Gln Glu Val Val Arg Ser Val Leu Glu Thr Gly Pro Pro Arg Tyr Ala
        980                 985                 990


Leu Thr Val Arg Ser Pro Ala Val  Leu Ser Arg Arg Thr  Leu Lys Ser
        995                 1000                1005


Gly Ala  Phe Pro Pro Gln Thr  Pro Glu Ala His Pro  Gln Ala Arg
    1010                1015                1020


Cys Leu  Cys Ala Pro Arg Arg  Gly Ala Leu Lys Pro  Glu Pro Pro
    1025                1030                1035


Gly Arg  Thr Leu Lys Leu Gly  Val Pro Pro His Thr  Thr Arg Lys
    1040                1045                1050


Ala Arg  Pro His Ala Ala Lys  Thr Ser Pro Arg Pro  Arg Cys Thr
    1055                1060                1065


Arg Gln  Ala Pro Asn Lys Thr  Gln Ser Leu Gln Leu  Ala Gly Lys
    1070                1075                1080


Ala Arg  Lys Thr Ala Leu His  Leu Gln Thr Lys Ala  Leu Val Gly
    1085                1090                1095


Asp Asp  Asp Thr Val Leu Gly  Val Lys Leu Ser Ile  Ala Asn Tyr
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Asp Leu
    1115


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